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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/083,508	02/27/2002	Tadayuki Fukuhara	020242	6486
23850	7590	06/22/2005	EXAMINER	
ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP 1725 K STREET, NW SUITE 1000 WASHINGTON, DC 20006			KIM, WESLEY LEO	
			ART UNIT	PAPER NUMBER
			2683	

DATE MAILED: 06/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/083,508

Applicant(s)

FUKUHARA ET AL.

Examiner

Wesley L. Kim

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2683

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-5 is/are allowed.
- 6) ☒ Claim(s) 6-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s):

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This office action is in response to Amendment filed on 1/25/05.
 - Claims 1 and 2 are cancelled.
 - Claims 3-8 are amended.
 - Claims 3-8 are pending and are examined in the instant office action.

Response to Arguments

Applicant's arguments with respect to claim 3-8 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

2. Claims 3-5 are allowed.
3. The following is a statement of reasons for the indication of allowable subject matter: Independent claims 3-5 establish selecting one of the antennas having the largest interference; rotating an angle of polarization plane called a reference angle so that interference becomes a minimum; This limitation is neither disclosed nor suggested in the prior art of record or newly cited references of Shapira et al (U.S. Pub. 2003/0162566 A1), Garrison (U.S. Patent 6577869 B1), McKesson (U.S. Patent 3453622), Lindskog et al (2004/0013211), and Mack et al (U.S. Patent 4051474).

Shapira et al teaches optimization of wireless networks including polarization of the beams to enhance performance and effective polarization matching on forward link transmissions to mitigate transmission losses due to the

polarization mismatch between hand-held MS's and BS's. However, there is no mention of selecting an antenna with the largest interference and rotating the angle of polarization plane so that the interference becomes a minimum.

Lindskog et al teaches antennas being classified into groups each having a plurality of antennas, so that interference between adjacent groups is small. There is no disclosure of the selection of one antenna having the largest interference for rotation of the polarization plane so that interference becomes a minimum.

Garrisson teaches of directional antennas orthogonally to each other within each cell to provide for greater isolation between signals, and a further reduction of interference. However there is no mention of selecting one antenna having the largest interference for rotation of the polarization plane so that interference becomes a minimum.

Mack et al teaches controlling the polarization of antennas minimizes interference from polarized signals yet there is no disclose of selecting one antenna having the largest interference for rotation of the polarization plane so that interference becomes a minimum.

McKesson teaches incorporating two or more antennas with different polarizations to provide selection of an antenna with the strongest signal or the best signal to noise ratio signal where the receivers in turn process the antenna signals to minimize the overall fading. There is no disclosure of the selection of

one antenna having the largest interference for rotation of the polarization plane so that interference becomes a minimum.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 6 rejected under 35 U.S.C. 103(a) as being unpatentable over Shapira et al (U.S. Pub. 2003/0162566 A1) in view of Garrison (U.S. Patent 6577869 B1).

Regarding Claim 6, Shapira teaches a radio LAN master station (Par.5;1-2) comprising; a transceiver (Fig.4A), a plurality of directivity antennas directed to each specific directions (Par.5;2 and Fig.3B), a power distributor coupling said antennas with said transceiver (Fig.4A, splitter), however Shapira is **silent on** selecting one of a horizontal polarization and a vertical polarization of each antenna, so that interference of said antenna is the smaller.

Garrison teaches that horizontal and vertical polarization can be interspersed within each cell to provide for greater isolation between signals, and further reduce interference (Col.6;35-48 and Col.4;30-53), so one skilled in the art would envision selecting one of a horizontal polarization and a vertical polarization of each antenna, so that the interference of said antenna is the smaller.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Shapira, such that the interference of said antenna is the small by selecting one of a horizontal polarization and a vertical polarization of each antenna, to provide a method of making sure the horizontal and vertical polarization can be interspersed within each cell to provide for greater isolation between signals, resulting in a further reduction of interference.

5. Claim 7 rejected under 35 U.S.C. 103(a) as being unpatentable over Shapira et al (U.S. Pub. 2003/0162566 A1) in view of Mack et al (U.S. Patent 4051474).

Regarding Claim 7, Shapira teaches a radio LAN master station (Par.5;1-2) comprising; a transceiver (Fig.4A), a plurality of directivity antennas directed to each specific directions (Par.5;2 and Fig.3B), a power distributor coupling said antennas with said transceiver (Fig.4A, splitter), however Shapira **is silent on** rotating a polarization plane of each antenna so that interference in said antenna is a minimum; and determining an angle of polarization plane which provides said minimum interference.

Mack et al teaches interference from polarized signals is minimized by controlling the polarization of antennas (Abstract), which to the examiner reads on the claim since one of ordinary skill in the art would interpret the term "controlling" in the phrase "controlling the polarization of antennas" to be rotating or turning or moving the polarization of antennas.

Mack et al teaches determining an angle of polarization plane which, provides said minimum interference (Col.2;30-53 and Fig.1c and Fig.1d).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Shapira, such that a polarization plane of each antenna is rotated so that the interference in said antenna is a minimum; and determining an angle of polarization plane which provides said minimum interference, to provide a method of discriminating against unwanted interfering signals by controlling the polarization of the antenna radiating elements to maintain antenna polarization is orthogonal to the unwanted interfering signals.

6. Claim 8 rejected under 35 U.S.C. 103(a) as being unpatentable over Shapira et al (U.S. Pub. 2003/0162566 A1) and Garrison (U.S. Patent 6577869 B1) in further view of Bustamante et al (U.S. Patent 5735140) and Lindskog et al (2004/0013211).

Regarding Claim 8, Shapira teaches a radio LAN master station (Par.5;1-2) comprising; a transceiver (Fig.4A), a plurality of directivity antennas directed to each specific directions (Par.5;2 and Fig.3B), a power distributor coupling said antennas with said transceiver (Fig.4A, splitter), however Shapira **is silent on** (a) the antennas being classified into groups each having a plurality of antennas, so that interference between adjacent groups is small: (b) determining a polarization plane of a

first antenna in a first group; (c) determining a polarization plane of a second antenna in a first group, said second antenna locating adjacent to said first antenna, so that a polarization plane of said second antenna is orthogonal to a polarization plane of said first antenna; (d) repeating said step (c) for other antennas; and (e) repeating said steps (b) and (c) for the antennas in other groups.

Lindskog et al teaches cells with antennas directional antennas classified in groups each having a plurality of antennas so that interference between adjacent groups is small (Col.9; Claim 19).

Garrison teaches that horizontal and vertical polarization can be interspersed within each cell to provide for greater isolation between signals, and further reduce intra-cell interference (Col.6;35-48 and Col.4;30-53), and

Bustamante et al teaches selecting an antenna with the strongest signal (Col.2;44-50) so one skilled in the art would envision determining if the polarization for that one antenna is horizontal or vertical and since adjacent antennas are orthogonal to one another (Fig.6;3 Garrison), to keep interference to a minimum, the second antennas polarization plane would be determined to be the opposite of the first antenna. It would be obvious to repeat steps (b) and (c) for the antennas in the other groups, so that intra-cell interference would be reduced by maintaining orthogonality of the antennas (Col.6; 35-48 and Col.4;30-53 Garrison).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Shapira, such that (a) the antennas are classified into groups each having a plurality of antennas, so that interference between adjacent groups is small; (b) determining a polarization plane of a first antenna in a first group; (c) determining a polarization plane of a second antenna in a first group, said second antenna locating adjacent to said first antenna, so that a polarization plane of said second antenna is orthogonal to a polarization plane of said first antenna; (d) repeating said step (c) for other antennas; and (e) repeating said steps (b) and (c) for the antennas in other groups, to provide a method of keeping intra-cellular interference to a minimum.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Bleret et al (U.S. Patent 6300900), Antenna for Transmitting and/or Receiving Signals with Rectilinear Polarization.
- Boch et al (U.S. Patent 6445926 B1), Use of Sectorized Polarization Diversity as a means of Increasing Capacity in Cellular Wireless Systems.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley L. Kim whose telephone number is 571-272-7867. The examiner can normally be reached on Monday-Friday 9:00am-5:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on 571-272-7872. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WLK



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